Laparoscopic treatment of severe acute pancreatitis


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Received: 26 October 1999/Accepted in final form: 4 August 2000/Online publication: 12 December 2000

Abstract

Background: The appropriate surgical treatment for severe acute pancreatitis has been disputed for a long time. Herein we describe our experience with the laparoscopic treatment of this disease.

Methods: Ten patients, seven male and three female, with an average age of 55 years were diagnosed with severe acute pancreatitis. All cases but one were found to be without biliary stones by ultrasonic and CT scans. Laparoscopic exploration, irrigation, drainage, and decompression of the pancreas were performed. Further treatment, including gastric decompression, irrigation via the drainage tubes, antibiotics, somatostatin, and parenteral nutrition, was continued in all patients following the laparoscopic procedures.

Results: Nine patients recovered successfully; one died from adult respiratory distress syndrome (ARDS) soon after the operation. The hospital stay was 10–30 days.

Conclusions: The laparoscopic era offers new hope for the treatment of severe acute pancreatitis. The technique can be used to determine the pathologic extent of the disease, to irrigate and drain the abdominal cavity, and to decompress the pancreas. Almost every surgical procedure for acute pancreatitis can be performed laparoscopically.

Key words: Laparoscopy — Acute pancreatitis — Surgical treatment — Drainage

Severe acute pancreatitis (SAP), or acute hemorrhagic and necrotic pancreatitis, is an acute disease characterized by a complicated pathological process. It is difficult to manage and has a relatively high mortality rate. Although great strides have been made both in the understanding of its pathologic process and in the treatment of this severe disease, the morbidity and mortality rates are still relatively high [2, 10]. Therefore, the results of treatment for SAP are still unsatisfactory. It is necessary to develop new approaches to deal with this serious disease.

The laparoscopic era offers new alternatives for the surgical treatment of SAP. Laparoscopic common bile duct exploration or endoscopic retrograde cholangiopancreatography (ERCP) plus laparoscopic cholecystectomy have been used to treat acute pancreatitis caused by bile duct stones [1, 5, 8]. Between July 1997 and May 1999, 10 patients with SAP were treated by laparoscopic abdominal exploration, irrigation, and drainage in our department. This is a preliminary report of our experience with the laparoscopic treatment of SAP.

Patients and methods

Between July 1997 and May 1999, 10 patients with severe acute pancreatitis were treated laparoscopically at our hospital. There were seven men and three women with a mean age of 55 years (range: 36–72). The diagnosis was established by an acute onset of severe upper abdominal pain and obvious tenderness, elevated serum or urine amylase levels (all except two cases), and ultrasound or CT images of a swollen pancreas with ascites or gallbladder stones (in one case). Regarding the etiology of the cases, we observed alcohol abuse in two patients and gallstones in one patient. The etiology was not clear in the other seven patients. All of the patients had severe pancreatitis according to Ranson's criteria [7]. They presented with elevated white blood cells (WBC), blood glucose, and lactate dehydrogenase (LDH), and decreased serum calcium and blood pressure. Bloody ascites was found via paracentesis, and the amylase level was increased in all the specimens of abdominal fluid in seven cases.

All 10 patients were operated on laparoscopically. The time from onset of the disease to operation was 24–72 h. The patients were placed in a supine position under general anesthesia with intratracheal intubation. Pneumoperitoneum was established and a 30° camera was inserted into the abdomen. Three other trocars were placed under direct vision. Bloody ascites was seen in all of the patients. Edematous small bowel was found in all cases during laparoscopic exploration.

The gastrocolic ligament was opened and the stomach was retracted upward by a fan retractor. The pancreas was then exposed clearly. Necrosis and bleeding of the pancreas appeared to different extents in all of the patients. Patchy necrosis on the pancreas was not debrided, because it was considered unnecessary. Large volumes of normal saline were used to irrigate the abdomen until the abdominal fluid became clear. The pancreatic retroperitoneum was opened with a hook cautery at its upper or lower border to decompress the pancreas. Four to six rubber drainage tubes were placed around the pancreas.

Postoperative peritoneal lavage continued through the drainage tubes until symptoms, signs, and amylase in lavage fluid became normal. Fasting
and gastrointestinal decompression were continued, while total parenteral nutrition was used to maintain the necessary nutrition. Somatostatin was given to inhibit the exocrine secretion of the pancreas. Antibiotics were used in all patients to deal with abdominal infections.

Results

All of the patients tolerated the operation well. Laparoscopic cholecystectomy was performed simultaneously in the patient with gallstones. Nine patients recovered completely. Eleven patients recovered with lesions after another 18 days of nonoperative treatment. A total of 5-10 L of fluid per day were used to wash out the abdominal cavity through the drainage tubes in all cases. The abdominal irrigation lasted 7-14 days. Gastric tubes were used to decompress the gastrointestinal tract in all patients for 7-20 days postoperatively. Parenteral nutrition (from the central or peripheral veins) was given to all patients during the fasting period.

Discussion

The treatment of SAP has involved many difficult problems up to now [10]. The most common causes of acute pancreatitis are biliary stones and alcohol abuse. It has been widely accepted that ERCP should be used in patients with acute pancreatitis caused by biliary tract stones, because it has been shown to be effective both in eliminating the nosogenesis and alleviating the symptoms of the disease [1, 5, 8]. In China, credible causes often cannot be found in patients who present with acute pancreatitis. The incidence of biliary pancreatitis is relatively lower in our country than it is in the West [11, 12]. In our series of patients, one patient had gallstones, but it is not clear whether they caused the onset of acute pancreatitis. Therefore, the problem of the etiology and treatment of nonbiliary acute pancreatitis requires further study.

In the 1970s, early surgical operation and large-scale debridement of necrotic pancreas were advocated, but these procedures are often associated with relatively high mortality and morbidity rates [13]. The strategy of individualization has now been accepted by many Chinese authors, which means that nonoperative treatment is implemented in the early period and surgical operation is performed when infection is discovered around the pancreas [12]. But in fact, it is difficult to determine at what point the patient should be transferred from nonoperative to operative treatment when the individualized approach is followed. The autodigestive effect of the abdominal fluid, which contains a large amount of pancreatic enzymes and toxic elements, can undoubtedly aggravate the pathological process of SAP. Surgical operation is usually resorted to when the nonoperative treatment has failed, the patient’s condition has deteriorated rapidly, and serious complications such as shock, encephalopathy, and ARDS have developed. Thus, good results cannot be achieved in this way.

The laparoscopic era offers new alternatives for the surgical treatment of SAP. One report of a large series assessed the role of combined laparoscopic cholecystectomy and selective ERCP in the treatment of acute biliary pancreatitis. This method was considered safe and effective [6] and has been widely accepted up to now [1, 5, 8]. In 1996, Gagner described laparoscopic debridement and necrosectomy for acute necrotizing pancreatitis [4]. Treatment of acute pancreatitis via laparoscopic necrosectomy, drainage, and irrigation of the lesser sac was also reported by Cuschieri et al. [3].

Although our experience has been limited, it suggests that the laparoscopic treatment of SAP has many advantages. We can explore, irrigate, decompress, and drain the pancreas, and perform postoperative lavage via the drainage tubes. The pathological extent of the disease can be determined and appropriate treatment approaches can be planned by laparoscopic exploration. The laparoscopic technique creates less trauma in the early treatment of SAP. It can be used not only to verify the extent and range of the pancreatic pathology but also to complete almost all of the operative procedures, as in open operations. Furthermore, postoperative lavage can dispel the autodigestive effects of the pancreatic fluid and help to improve the patient’s situation.

Laparoscopic surgery is only one aspect of the treatment for SAP. Other aspects of general management, such as fasting, gastric decompression, antienzymatic drugs, antibiotics, and parenteral nutrition, are also important to the patient’s recovery. The purpose of the laparoscopic operation, in fact, is to effect early elimination of the abdominal enzymatic exudate. By reducing the autodigestive effect of the abdominal exudate, this procedure facilitates the patient’s improvement. Postoperative continuous lavage can effectively eliminate the toxic enzymatic substance in the abdominal cavity and prevent it from entering the circulation. The drainage tubes serve as pathways not only for the outflow of abdominal exudate but also the inflow of lavage fluid. The indication for removal of the drainage tubes is improvement in the patient’s general situation, disappearance of the abdominal amylase, and reduction of the volume of outflow from the tubes.

The advantages of the laparoscopic treatment of SAP are a reduction in surgical trauma, ability to verify the extent and range of the pathology, and full drainage of the toxic substances from the abdominal cavity. We recommend that patients with severe acute pancreatitis be considered for laparoscopic surgery when 1-2 days of conservative management fail. The indications and contraindications for the laparoscopic procedure should be the same as those for open procedures. Early laparoscopic exploration should be considered when it is difficult to judge whether there is any pancreatic infection or necrosis.

Generally speaking, laparoscopic exploration, decompression, irrigation, and drainage are safe and simple procedures. However, in patients with severe pancreatic infection and necrosis, large-scale debridement and necrosectomy must be done. This approach may lead to severe postoperative complications such as hemorrhage and pancreatic fistula, as in routine open surgery. In the surgical treatment of SAP, almost all operative procedures can be completed laparoscopically. Therefore, laparoscopic management of SAP is safe, effective, and less traumatic than